

2CERTIFICATION UNDER 37 CFR 1.10

EL 7403882604US

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September 27, 2001

Date of Deposit

I hereby certify that this paper or fee, and any documents referred to as enclosed herein, are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Box PCT, Washington, D.C. 20231.

Cederic Rodgers

Name of Person Mailing Application

Signature of Person Mailing Application

U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

MCI-004.1

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

Not known

09/937592

INTERNATIONAL APPLICATION NO.
PCT/US00/09927

INTERNATIONAL FILING DATE
14 APRIL 2000

PRIORITY DATE CLAIMED
14 APRIL 1999

TITLE OF INVENTION

ALKANOLAMIDE SURFACTANT EMULSIONS AND PROCESS THEREFOR

LICANT(S) FOR DO/EO/US

1 GRAY and Eugene D'AVERSA

Licant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

- ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
- ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
- ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
- ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
- ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
- ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
- ☐ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☐ have not been made and will not be made.
- 8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
- 9. ☒ An oath or declaration of the inventor(s) 35 U.S.C. 371(c)(4)) and **Power of Attorney**.
- 10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11 to 16 below concern other document(s) or information included:

- 11. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
- 12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
- 13. ☒ A FIRST preliminary amendment.
- ☐ A SECOND or SUBSEQUENT preliminary amendment.

INTERNATIONAL APPLICATION NO.
PCT/US00/09927

ATTORNEYS DOCKET NUMBER
MCI-004.1

17. ☒ The following fees are submitted:

Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO	\$1,000.00
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO	\$860.00
International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search fee (37 CFR 1.445(a)(2)) paid to USPTO	\$710.00
International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)	\$690.00
International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)	\$100.00

CALCULATIONS

PTO USE ONLY

\$690.00

\$0.00

TOTAL OF ABOVE CALCULATIONS =		\$924.00
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\$462.00

\$462.00

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MCI-004.1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: John Gray and Eugene D'Aversa)
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Serial No.: Not yet known) Examiner: Not yet known
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Filed: September 27, 2001)
(by Express Mail))
) Art Unit: Not yet known
International)
Filing Date: April 14, 2000)
)
International)
Serial No.: PCT/US00/09927)
)
For: ALKANOLAMIDE SURFACTANT)
EMULSIONS AND PROCESS THEREFOR)

PRELIMINARY AMENDMENT

Commissioner for Patents
Washington, D. C. 20231
Box: PCT

Sir:

This communication is submitted in advance of prosecution on the merits of the above identified application. The application is based on the specification pages 1-7, 9, 10 and 11-24 and claims pages 25-30 as originally filed and pages 8 and 11 of the amended description filed with the letter of February 9, 2001 and upon which the International Preliminary Examination Report is based, a copy of which is being concurrently filed herewith. Please amend this application as follows.

IN THE SPECIFICATION:

On page 1 of the International Application as published, after the title, amend the specification by inserting the following heading:

-- Cross-Reference To Related Application

This application claims the priority of U.S. Serial No. 09/292,765, filed April 14, 1999, now U.S. Provisional Application Serial No. 60/287,574 filed April 14, 1999. --

In the Specification:

Please replace the paragraph beginning at line 3 on page 10 with the following rewritten paragraph.

-- The type and amount of monoalkanolamide and emulsifying surfactant employed for preparing the inventive surfactant emulsions is limited only to the extent to which the emulsifying surfactant is capable of emulsifying the monoalkanolamide and producing a monoalkanolamide surfactant emulsion. Preferably, a monoalkanolamide surfactant emulsion contains, on a total emulsion weight basis, about 1 to about 30 weight percent or an active weight basis of a monoalkanolamide emulsified with about 5 to about 30 weight percent on an active weight basis of monoalkanolamide emulsifying surfactant. --

Please replace the paragraph beginning at line 23 on page 10 and ending on line 4 on page 11, with the following rewritten paragraph.

-- The emulsifying surfactants preferably, without being limited thereto, are water soluble surfactants or

salts thereof selected from the group consisting of amphoteric surfactants, zwitterionic surfactants, anionic surfactants, nonionic surfactants, cationic surfactants and non-interactive mixtures thereof. It is recognized that interaction between certain cationic surfactants and anionic surfactants may occur which precipitate as water-insoluble solids, but it is also recognized that compatible mixtures of cationically charged surfactants and anionic surfactants are known in the art. Thus, the type of emulsifying surfactant and surfactant mixture employed is not limited so long as interaction, if any, between surfactants does not result in solid precipitate formation and interfere with the formation of the monoalkanolamide surfactant emulsion. --

Please replace the paragraph beginning at line 4 on page 12 with the following rewritten paragraph.

-- Anionic surfactants preferably include, without being limited thereto, alkyl sulfates, alkylether sulfates having from 1 to about 10 moles ethylene oxide groups, acylisethionates, sarcosinates, sulfosuccinates and alkali metal salts thereof, wherein the alkyl group or acyl group

has from about 8 to about 24 carbon atoms, preferably from about 12 to about 18 carbon atoms, and mixtures thereof.

Sodium salts of alkylether sulfates having an average range of from 1 to 4 moles, preferably 3 moles, ethylene oxide are particularly preferred. --

IN THE CLAIMS:

Cancel claims 1-31 and substitute therefor the following clean set of claims 32-64.

-- 32. A liquid monoalkanolamide surfactant emulsion suitable for cold mixing processes consisting essentially of:

- (a) a monoalkanolamide that is substantially solid and insoluble in water at a temperature below about 30°C;
- (b) an emulsifying effective amount of a monoalkanolamide emulsifying surfactant; and on a total monoalkanolamide surfactant emulsion weight basis,
- (c) up to about 10 weight percent of a water soluble inorganic electrolyte salt; and
- (d) up to about 15 weight percent of a non-surfactant organic solvent; and
- (e) the balance being water;

wherein the liquid monoalkanolamide surfactant emulsion has a total solids content in the range of about 20 to about 60 weight percent, and is phase stable and pumpable at a temperature in the range of about zero to about 30°C.

33. The liquid monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide is present in an amount of about 1 to about 30 weight percent on a total monoalkanolamide surfactant emulsion weight basis.

34. The liquid monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide emulsifying surfactant is present in an amount of about 5 to about 30 weight percent on a total monoalkanolamide surfactant emulsion weight basis.

35. The liquid monoalkanolamide surfactant emulsion of claim 32 wherein the weight ratio of monoalkanolamide to monoalkanolamide emulsifying surfactant is in the range of about 1:6 to about 6:1.

36. The monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide is selected from the group consisting of a monoethanolamide, a monoisopropanolamide, a diethylene glycolamide and mixtures thereof.

37. The monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide is monoethanolamide in an amount of about 6 to about 25 weight percent by weight on a total monoalkanolamide surfactant emulsion weight basis.

38. The monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide emulsifying surfactant is a water soluble surfactant or salt thereof selected from the group consisting of an amphoteric surfactant, a zwitterionic surfactant, an anionic surfactant, a nonionic surfactant, a cationic surfactant and non-interactive mixtures thereof.

39. The monoalkanolamide surfactant emulsion of claim 32 wherein the appearance of the monoalkanolamide surfactant emulsion ranges from substantially transparent to pearlescent.

40. The monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide is an alkanolamine condensate of a fatty acid selected from the group consisting of lauric acid, palmitic acid, stearic acid, oleic acid, linoleic acid and mixtures thereof.

41. The monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide comprises an alkanolamine condensate of a fatty acid derived from a plant oil selected from the group consisting of coconut oil, soybean oil, canola oil, wheat germ oil, peanut oil, corn oil, olive oil and mixtures thereof.

42. The monoalkanolamide surfactant emulsion of claim 32 in which the monoalkanolamide is selected from the group consisting of coconut monoethanolamide, lauric monoethanolamide, stearic monoethanolamide, oleic monoethanolamide, linoleic monoethanolamide, lauric isopropanolamide, coconut diglycolamide and mixtures thereof.

43. The monoalkanolamide surfactant emulsion of claim 32 wherein the emulsifying surfactant is an amphoteric surfactant selected from the group consisting of an acylamphoacetate, an acylamphodiacetate, an acylamphopropionate and water soluble salts thereof wherein the acyl group has about 8 to about 22 carbon atoms.

44. The monoalkanolamide surfactant emulsion of claim 32 wherein the emulsifying surfactant is a zwitterionic surfactant selected from the group consisting of an alkyl betaine, an

alkylamido betaine, an alkyl sultaine, and an alkylamido sultaine, wherein the alkyl group has from about 8 to about 22 carbon atoms.

45. The monoalkanolamide surfactant emulsion of claim 32 wherein the emulsifying surfactant is sodium cocoamphopropionate.

46. The monoalkanolamide surfactant emulsion of claim 32 wherein the emulsifying surfactant is cocobetaine.

47. The monoalkanolamide surfactant emulsion of claim 32 wherein the emulsifying surfactant is cocamidopropyl betaine.

48. The monoalkanolamide surfactant emulsion of claim 32 wherein the emulsifying surfactant is lauryl betaine.

49. The monoalkanolamide surfactant emulsion of claim 32 in which the monoalkanolamide is coconut monoethanolamide and the emulsifying surfactant is selected from the group consisting of an amphoteric surfactant, a zwitterionic surfactant, an anionic surfactant and mixtures thereof.

50. The monoalkanolamide surfactant emulsion of claim 32 wherein the emulsifying surfactant comprises an anionic surfactant selected from the group consisting of an alkyl sulfate, an alkyl ether sulfate having from 1 to about 10 moles ethylene oxide groups, an acylisethionate, a sarcosinate, a sulfosuccinate and alkali metal salts thereof, wherein the alkyl group or acyl group has from about 8 to about 24 carbon atoms, and mixtures thereof

51. The monoalkanolamide surfactant emulsion of claim 32 further including fragrance.

52. The monoalkanolamide surfactant emulsion of claim 32 wherein the inorganic electrolyte salt is selected from the group consisting of alkali metal salts of hydrochloric acid and sulfuric acid.

53. The monoalkanolamide surfactant emulsion of claim 32 wherein the non-surfactant organic solvent is a cosmetically acceptable polyol, alcohol or mixture thereof.

54. The monoalkanolamide surfactant emulsion of claim 32 wherein the monoalkanolamide surfactant emulsion is pearlescent and, when subsequently incorporated by cold mixing into a separately prepared liquid aqueous formulation containing at least one principal surfactant, produces a substantially transparent product.

55. A cold mixing process for preparing a liquid aqueous cleanser containing monoalkanolamide, the process comprising the step of cold mixing a liquid monoalkanolamide surfactant emulsion into a separately prepared aqueous formulation containing at least one principal surfactant, wherein the liquid monoalkanolamide surfactant emulsion comprises on a total monoalkanolamide surfactant emulsion weight basis:

(a) about 1 to about 30 active weight percent of a monoalkanolamide that is substantially solid and insoluble in water at a temperature below about 30°C;

(b) an emulsifying effective amount of a monoalkanolamide emulsifying surfactant selected from the group consisting of an amphoteric surfactant, a zwitterionic surfactant, an anionic surfactant, a nonionic surfactant, a cationic surfactant and non-interactive mixtures thereof;

(c) up to about 10 weight percent of a water soluble inorganic electrolyte salt;

- (d) up to about 15 weight percent of a non-surfactant organic solvent; and
- (e) the balance being water;

wherein the monoalkanolamide surfactant emulsion has a total solids content in the range of about 20 to about 60 weight percent and remains phase stable and pumpable at a temperature in the range of about zero to about 30°C.

56. The cold mixing process of claim 55 wherein the monoalkanolamide is coconut monoethanolamide.

57. The cold mixing process of claim 55 wherein the monoalkanolamide emulsifying surfactant is an amphoteric surfactant selected from the group consisting of an acylamphoacetate, an acylamphodiacetate, an acylamphopropionate, and water soluble salts thereof wherein the acyl group has about 8 to about 22 carbon atoms and the principal surfactant is an anionic surfactant selected from the group consisting of an alkylaryl sulfonate, an alkyl sulfate, an alkyl ether sulfate, having from 1 to about 4 moles ethylene oxide, an alkyl sulfonate, a sulfosuccinate and alkali metal salts thereof and mixtures thereof, wherein the alkyl group contains from about 12 to about 18 carbon atoms.

58. The cold mixing process of claim 55 including the further step of cold mixing a fragrance in the monoalkanolamide surfactant emulsion prior to cold mixing the resulting fragranced emulsion with the separately prepared aqueous formulation.

59. The cold mixing process of claim 55 wherein the aqueous monoalkanolamide surfactant emulsion is pearlescent and produces a substantially transparent cleanser.

60. The cold mixing process of claim 55 wherein the cleanser is in the form of a shampoo, bubble bath, liquid soap or body wash.

61. A liquid monoethanolamide surfactant emulsion consisting essentially of, on a total monoalkanolamide surfactant emulsion weight basis:

- (a) about 6 to about 25 active weight percent of coconut monoethanolamide;
- (b) about 5 to about 30 active weight percent of a monoalkanolamide emulsifying surfactant selected from the group consisting of an amphoteric surfactant, a zwitterionic surfactant, an anionic surfactant, and non-interactive mixtures thereof;
- (c) up to about 10 weight percent of an inorganic alkali metal salt of hydrochloric or sulfuric acid;
- (d) up to about 15 weight percent of a nonsurfactant, cosmetically acceptable, organic solvent; and
- (e) the balance being water;

wherein the liquid monoalkanolamide surfactant emulsion is a phase stable, pourable, and pumpable liquid at a temperature in the range of about zero to about 30°C and contains a total solids content in the range of about 20 weight percent to about 60 weight percent.

62. The monoethanolamide surfactant emulsion of claim 61, further including fragrance.

63. A liquid monoalkanolamide surfactant emulsion consisting essentially of:

- (a) a monoalkanolamide that is substantially solid and insoluble in water at a temperature below about 30°C;

(b) an emulsifying effective amount of a monoalkanolamide emulsifying surfactant;
and on a total monoalkanolamide surfactant emulsion weight basis,

(c) up to about 10 weight percent of a water soluble inorganic electrolyte salt;

(d) up to about 15 weight percent of a non-surfactant organic solvent; and

(e) the balance being water;

wherein said emulsion has a total solids content in the range of about 20 to about 60 weight percent and remains phase stable and pumpable at a temperature in the range of about zero to about 30°C; and wherein the monoalkanolamide surfactant emulsion is formed by first emulsifying the monoalkanolamide at a temperature in the range of about 40 to about 70°C with the emulsifying surfactant in the form of an aqueous concentrate containing at least about 30 weight percent water, and second adjusting the total solids content of the so formed emulsion by adding sufficient water thereto.

64. The monoalkanolamide surfactant emulsion of claim 63, wherein the emulsion is prepared under an inert atmosphere. --

IN THE ABSTRACT:

Submitted herewith as a separate page is the Abstract containing the subject matter of the Abstract in the published International Application, WO 00/61086.

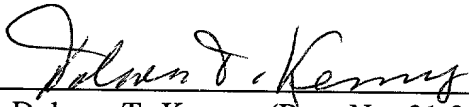
REMARKS

Claims 32-64 are pending in the application. By this Amendment, a claim for priority to a prior filed U.S. Provisional application has been added to the specification in accordance with 35 U.S.C. 119(e).

The amendments to the specification clarify the text and obviate some typing and punctuation errors. The amendments do not introduce new matter or affect the scope of the claimed subject matter. Attached hereto is a marked-up version of the changes made to the specification by the current amendment. A clean set of new claims has been submitted. The attached page is captioned "Version with markings to show changes made."

The foregoing amendments are submitted in advance of prosecution so as to expedite the prosecution of this application. Early and favorable consideration on the merits is solicited.

Respectfully submitted,

By 
Dolores T. Kenney (Reg. No. 31,269)

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ABSTRACT

Phase stable, pumpable, liquid, high solids, aqueous monoalkanolamide surfactant emulsions are disclosed for use as cold mixable monoalkanolamide delivery systems for separately prepared aqueous formulations containing at least one principal surfactant. The monoalkanolamide surfactant emulsions comprise at least one monoalkanolamide characterized in its unemulsified form by having an amide content of at least about 85% and by being substantially solid and water insoluble at a temperature below about 30°C, and at least one monoalkanolamide emulsifying surfactant and, surprisingly, remain homogeneous, pourable, and pumpable at a total solids content of at least 20 weight percent at a temperature in the range of about zero°C to about 30°C.

Version with markings to show changes made

In the Specification

Paragraph beginning on page 3 of page 10 has been amended as follows.

The type and amount of monoalkanolamide and emulsifying surfactant employed for preparing the inventive surfactant emulsions is limited only to the extent to which the emulsifying surfactant is capable of emulsifying the monoalkanolamide and producing a monoalkanolamide surfactant emulsion. Preferably, a monoalkanolamide surfactant emulsion contains, on a total emulsion weight basis, about 1 to about 30 weight percent [of] or an active weight basis of a monoalkanolamide [is] emulsified with about 5 to about 30 weight percent on an active weight basis of monoalkanolamide emulsifying surfactant. --

Paragraph beginning at line 10 of page 10 has been amended as follows.

The emulsifying surfactants preferably, without being limited thereto, are water soluble surfactants or salts thereof selected from the group consisting of amphoteric surfactants, zwitterionic surfactants, anionic surfactants, nonionic [surfactants'] surfactants, cationic surfactants and non-interactive mixtures thereof. It is recognized that interaction between certain cationic surfactants and anionic surfactants may occur which precipitate as water-insoluble solids, but it is also recognized that compatible mixtures of cationically charged surfactants and anionic surfactants are known in the art. Thus, the type of emulsifying surfactant and surfactant mixture employed is

Version with markings to show changes made (cont'd)

not limited so long as interaction, if any, between surfactants does not result in solid precipitate formation and interfere with the formation of the monoalkanolamide surfactant emulsion.

Paragraph beginning on line 4 of page 12 has been amended as follows.

Anionic surfactants preferably include, without being limited thereto, alkyl sulfates, alkylether sulfates having from 1 to about 10 moles ethylene oxide groups, acylisethionates, sarcosinates, sulfosuccinates and alkali metal salts thereof, wherein the alkyl group or acyl group has from about 8 to about 24 carbon atoms, preferably from about 12 to about 18 carbon atoms, and mixtures thereof. Sodium salts of alkylether sulfates having an average range of from 1 to 4 moles, preferably 3 moles, ethylene oxide are particularly preferred.

In the claims:

Claims 1-31 have been canceled.

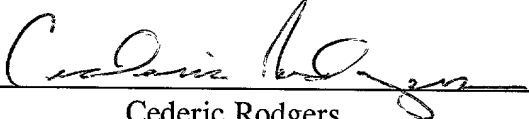
PCT/US00/09927 ----- 16

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Cederic Rodgers

09/937592

09/937583

PTO/PCT Rec'd 27 SEP 2001

ALKANOLAMIDE SURFACTANT EMULSIONS AND PROCESS THEREFOR

Technical Field of the Invention

This invention relates to novel liquid aqueous monoalkanolamide delivery systems and more particularly to liquid monoalkanolamide surfactant emulsions and cold mix processes therefor.

Background of the Invention

For many years, alkanolamides, and particularly diethanolamides derived from lauric, stearic or coconut oil fatty acids, have been commonly and primarily employed as cost-effective foam boosters, foam stabilizers, and viscosity builders in liquid surfactant formulations where good foam generation is needed and desired. For example, foaming properties are particularly desirable and important in personal care cleanser products, such as shampoos, body cleansers; bubble baths and the like, and light duty household cleanser products, such as liquid dish washing products, liquid hand soaps and the like.

Cocodiethanolamides, in particular, have, for many years, been important nonionic surfactants in the industry and are commonly referred to as cocamide DEA, the name assigned this material in the International Cosmetic Ingredient Dictionary, Sixth Edition, published by The Cosmetic, Toiletry, and Fragrance Association (1995) (hereafter "INCI Dictionary"), the disclosures of which are incorporated herein by reference. Such name assignments are conventionally referred to as INCI names and will be so used herein.

Cocamide DEA derivatives are commercially available in pourable, pumpable, liquid form at ambient room temperature (about 30°C), which form is particularly desirable, easy to handle and, in trade parlance,

cold-mixable, i.e., desirably mixed into liquid formulations at ambient room temperature without requiring heating. Cold mixing is industrially desirable as it avoids heating the compounded formulation, thereby avoiding deteriorating heat-sensitive ingredients when present, minimizing the possibility of heat-induced product instability, reducing loss of volatiles, including water, lowering energy costs and manufacturing costs and the like.

Recently, however, the diethanolamines, which are used to manufacture diethanolamide derivatives, became the subject of certain animal toxicity studies which were reported to the public in the popular press. The negative press and toxicity issues raised by the publication of this report, in turn, created, in the minds of the public, a perceived toxicity associated with the presence of diethanolamides and of cocamide DEA, in particular, which appeared commonly as a listed ingredient on the labels of most personal care cleanser products. Consequently, this negative public opinion has created a need and desire in the personal care industry to replace diethanolamides with alternate foam boosters and foam stabilizers that are still functional, are substantially free of diethanolamine or diethanolamides, and preferably are cold mixable at ambient room temperature.

It is known that monoalkanolamides, derived from the reaction of C₂-C₆ alkanolamines, such as monoethanolamine, isopropanolamine, diethylene glycolamine (2-(2-aminoethoxy)ethanol) and the like, and fatty acids having from about 8 to about 24 carbon atoms are potentially functional in applications requiring foam boosting, foam stabilizing and viscosity building. In particular, coconut oil derived monoethanolamine derivatives are of great commercial interest for use in personal care and household products.

Coconut monoethanolamide, referred to hereafter by the INCI name cocamide MEA, are known to have more foam boosting efficacy and more viscosity building efficacy than cocamide DEA. However, unlike cocamide DEA, cocamide MEA, is not commercially available as a pourable, pumpable, liquid form at ambient room temperature. The existing cocamide MEA products of commerce are normally substantially solid products sold in flaked form. Moreover, cocamide MEA is insoluble in water, so to incorporate it into an aqueous surfactant formulation, the compounded formulation must be heated above the melting point of cocamide MEA (above 60°C). Additionally, cocamide MEA in heated molten form, as well as in unheated flaked form, is susceptible to browning discoloration on exposure to air during storage over a period of time. Such solubility and discoloration problems have limited the use of cocamide MEA, particularly in personal care products.

Monoalkanolamide derivatives prepared from the reaction of either monoethanolamine or isopropanolamine and vegetable oil unsaturated fatty acids, such as from soybean or canola (genetically modified rapeseed oil), have a lower melting point than that of coconut oil fatty acid derivatives, but also are not obtained in liquid form at ambient room temperature. These vegetable oil derived monoalkanolamides can be converted to a form remaining liquid at ambient room temperature with further chemical modification, such as alkoxylation with ethylene oxide, propoxylation with propylene oxide or a combination thereof. However, while such chemical modification can reduce the cloud point of the original starting monoalkanolamide, it normally produces an undesirable discolored product that is less effective than the unmodified monoalkanolamide in foam stabilizing or viscosity building properties. Further, the use of ethylene

oxide is often looked upon as a "non-natural" feedstock, particularly from an environmental and aesthetic viewpoint, and can introduce other potentially toxic impurities, such as dioxane. Additionally, extra chemical processing

5 increases handling and manufacturing costs.

It is known that soybean monoalkanolamide and canola monoalkanolamide derivatives prepared with diethylene glycolamine are in liquid form at ambient room temperature. However, such soybean and canola oil derived
10 diglycolamides have undesirable brown colorations, undesirable strong odors and when used for viscosity control applications, produce an undesirable "stringy" viscosity, making them aesthetically and functionally unsuitable for personal care products. Additionally, the
15 browning coloration of these monoalkanolamides in an air atmosphere typically worsens in appearance over time to a much greater extent than that normally observed in cocamide MEA.

Prior attempts to incorporate monoalkanolamides
20 in surfactant formulations without heating the surfactant formulations have been made by employing solvents, such as cosmetically acceptable alcohols, for example, ethanol, isopropanol, and the like, or polyols, such as propylene glycol, glycerin and the like, or employing a hydrotroping
25 agent, such as sodium xylene sulfonate. However, the use of solvents, particularly volatile alcohols, raises environmental issues and increases handling and manufacturing costs.

Thus, there is an ongoing, unresolved, commercial
30 need for a relatively concentrated, high solids form of liquid monoalkanolamide delivery system, particularly for monoethanolamide, that can be cold mixed into separately prepared aqueous surfactant containing formulations, and cleanser formulations in particular, which typically

contain a principal surfactant for the purpose of
detersiveness and foaming. The novel cold mixable, liquid
monoalkanolamide surfactant emulsions of this invention
provide such a delivery system.

5 Summary of the Invention

It has been discovered that pourable, pumpable,
liquid aqueous monoalkanolamide surfactant emulsions can be
prepared which are useful cold mixable delivery systems for
incorporating monoalkanolamide into separately prepared
10 aqueous formulations containing at least one surfactant.

The inventive liquid aqueous monoalkanolamide
delivery system is in the form of a phase stable, pumpable,
high solids monoalkanolamide surfactant emulsion at a
temperature in the range of zero°C to about 30°C. The
15 monoalkanolamide surfactant emulsion preferably comprises,
on a total emulsion weight basis:

about 1 to about 30 weight percent on an active
weight basis of at least one monoalkanolamide characterized
in it unemulsified form by having an amide content of at
20 least 85%, and being substantially solid and water
insoluble at a temperature below about 30°C;

about 5 to about 30 weight percent on an active
weight basis of at least one monoalkanolamide emulsifying
surfactant;

25 zero to about 10 weight percent water soluble
inorganic electrolyte salt;

zero to about 15 weight percent non-surfactant,
organic solvent; and the balance being water. The
monoalkanolamide surfactant emulsion contains a total
30 solids content in the range of at least about 20 weight
percent to not more than about 60 weight percent and is
cold mixable into a separately prepared liquid aqueous
formulation containing at least one principal surfactant.

Preferred monoalkanolamide surfactant emulsion
embodiments have a weight ratio, on a active weight basis,
of monoalkanolamide:emulsifying surfactant in the range of
from about 1:6 to about 6:1. The monoalkanolamide

5 emulsifying surfactants are preferably water soluble
surfactants or salts thereof selected from the group
consisting of amphoteric surfactants, zwitterionic
surfactants, anionic surfactants, nonionic surfactants,
cationic surfactants, and non-interactive mixtures thereof.

10 It was surprisingly found that liquid, aqueous
monoethanolamide surfactant emulsion embodiments containing
commercial cocamide MEA (having an amide content greater
than 85%) remained homogeneous, pourable, pumpable and cold
mixable at cocamide MEA active weight concentrations of
15 about 5 to about 30 weight percent on a total emulsion
weight basis.

Advantageously, the monoalkanolamide surfactant
emulsions can be cold mixed into a formulation having at
least one principal surfactant and provide foam boosting,
20 foam stabilization, viscosity control or combination
thereof. Further, the emulsifying agent employed can also
have the dual function of being a secondary surfactant.

The monoalkanolamide surfactant emulsions
beneficially provide a cost effective, cold mixable, liquid
25 delivery system for incorporating monoalkanolamide MEA into
personal care and household care cleansers. In particular,
preferred cold mixable cocamide MEA surfactant emulsions
beneficially retain the efficacy of cocamide MEA for foam
boosting, foam stabilizing and viscosity control normally
30 associated therewith and avoid the limitations of prior
heat mixing processes.

Description of the Preferred Embodiment

The term "monoalkanolamide" as used herein refers to monoalkanolamides which are the reaction products of C₂-C₆ alkanolamines having a primary amine functionality, such as monoethanolamine, isopropanolamine, diethylene glycolamine (2-(2-aminoethoxy)ethanol), and the like, and fatty acids having from about 8 to about 24 carbon atoms, preferably from about 10 to about 22 carbon atoms, more preferably from about 12 to about 18 carbon atoms, have an amide content of at least 85%, are normally substantially solid, and water insoluble at an ambient temperature of below about 30°C. The term "fatty acids" as used herein includes straight or branched chain, saturated or unsaturated fatty acids which are derived from fats, e.g., plant oils, tallow, and the like or synthesized, so long as the monoalkanolamine condensate thereof forms a monoalkanolamide surfactant emulsion.

The term "cold mixable" and "cold mix" is used herein to refer to a mixing process, as by pumping, carried out at temperatures in the range of from zero°C to about 30°C. The term "substantially solid" as used herein means that the compound or product is in a non-pourable paste or flake form, and is thereby non-liquid and non-pumpable for cold mix processing by conventional pumping equipment known in the processing arts.

The term "monoalkanolamide surfactant emulsion" as used herein refers to a homogeneous, high solids, pourable, pumpable, cold mixable liquid monoalkanolamide delivery system containing at least one monoalkanolamide and at least one monoalkanolamide emulsifying surfactant. The terms "homogeneous" and "phase stable" as applied to monoalkanolamide surfactant emulsions mean that no visible, physical phase separation of the monoalkanolamide from the aqueous medium is observed on storage standing at an

30°C, over a period of at least one week. The term "high solids" as used herein means that the sum of all non-volatile components in the emulsion is in the range of at least about 20 weight percent to not more than about 60 weight percent, preferably in the range of about 25 weight percent to not more than about 55 weight percent, of the total emulsion weight.

Monoalkanolamides useful herein can be made by any process known in the art so long as they form a monoalkanolamide surfactant emulsion. Commercially available monoalkanolamides suitable for preparing monoalkanolamide surfactant emulsions of this invention are available from a number of suppliers and can be prepared by any of various known synthetic processes, such as, but not limited to, the catalytic trans-esterification of fatty acids or derivatives thereof (commonly referred to as superamides) or by direct amidation of fatty acids with C₂-C₆ alkanolamine. Non-limiting examples of commercially available monoalkanolamides and suppliers are found in the INCI Dictionary, incorporated herein by reference.

Preferred monoalkanolamides are alkanolamine condensates of fatty acids such as, but not limited to, lauric acid, palmitic acid, stearic acid, oleic acid, linoleic acid and fatty acids derived from plant oils such as, but not limited to coconut oil, soybean oil, canola oil (genetically modified Canadian rapeseed oil), wheat germ oil, peanut oil, corn oil, olive oil, and the like and mixtures thereof. As long as a monoalkanolamide surfactant emulsion can be formed, the type of plant oil employed for making monoalkanolamide derivatives is limited only by economics or commercial production of such oils.

Preferred monoalkanolamides are monoethanolamides, such as, but not limited to, coconut monoethanolamide (cocamide MEA), lauric monoethanolamide,

monoethanolamide (cocamide MEA), lauric monoethanolamide, stearic monoethanolamide, oleic monoethanolamide, and linoleic monoethanolamide. Cocamide MEA is particularly preferred. A preferred monoisopropanolamide is lauric
5 isopropanolamide, and a preferred diethylene glycolamide is coconut diglycolamide.

The monoalkanolamide surfactant emulsions can be prepared by emulsifying at least one monoalkanolamide with a sufficient amount of at least one monoalkanolamide
10 emulsifying surfactant in an aqueous emulsifying medium by heating the emulsifying medium to a temperature below about 90°C, preferably in the range of about 40° to about 70°C, for a period sufficient to substantially solubilize the monoalkanolamide to a homogeneous emulsion, and then
15 cooling the monoalkanolamide surfactant emulsion. Surprisingly, the so formed, high solids, monoalkanolamide surfactant emulsion on cooling remains in a homogeneous, pourable, and pumpable liquid form at a temperature in the range of from about zero°C to about 30°C.

A preferred monoalkanolamide surfactant emulsion can be formed by first emulsifying the monoalkanolamide at a temperature in the range of about 40° to about 70°C with the emulsifying surfactant in the form of an aqueous concentrate containing at least about 30 weight percent
20 water, and second adjusting the total solids content of the so formed emulsion at a temperature preferably in the range of about 40° to about 50°C by adding sufficient water thereto. More preferably, the foregoing monoalkanolamide surfactant emulsion is formed under an inert atmosphere,
25 preferably nitrogen, to minimize browning discoloration of the monoalkanolamide.
30

The monoalkanolamide surfactant emulsions can be prepared and stored for future use or alternatively, be

prepared for substantially immediate use as a liquid monoalkanolamide delivery system in cold mix processes.

The type and amount of monoalkanolamide and emulsifying surfactant employed for preparing the inventive surfactant emulsions is limited only to the extent to which the emulsifying surfactant is capable of emulsifying the monoalkanolamide and producing a monoalkanolamide surfactant emulsion. Preferably, a monoalkanolamide surfactant emulsion contains, on a total emulsion weight basis, about 1 to about 30 weight percent of an active weight basis of a monoalkanolamide is emulsified with about 5 to about 30 weight percent on an active weight basis of monoalkanolamide emulsifying surfactant.

Preferably the weight ratio of monoalkanolamide:emulsifying surfactant employed on an active weight basis is in the range of about 1:6 to about 6:1, more preferably in the range of from about 1:5 to about 5:1, most preferably in the range of from about 1:4 to about 4:1. The term "active weight" is used herein to denote the concentration of "active" monoalkanolamide or emulsifying surfactant in the monoalkanolamide surfactant emulsion.

The emulsifying surfactants preferably, without being limited thereto, are water soluble surfactants or salts thereof selected from the group consisting of amphoteric surfactants, zwitterionic surfactants, anionic surfactants, nonionic surfactants' cationic surfactants and non-interactive mixtures thereof. It is recognized that interaction between certain cationic surfactants and anionic surfactants may occur which precipitate as water-insoluble solids, but it is also recognized that compatible mixtures of cationically charged surfactants and anionic surfactants are known in the art. Thus, the type of emulsifying surfactant and surfactant mixture employed is

not limited so long as interaction, if any, between surfactants does not result in solid precipitate formation and interfere with the formation of the monoalkanolamide surfactant emulsion.

- 5 The term "amphoteric surfactants" refers to that class of surfactants that can exist in three different charged forms depending on pH; i.e., cationic, zwitterionic or anionic, and includes the water-soluble salts thereof. Suitable amphoteric surfactants include, but are not
- 10 limited to, acylamphoacetate, acylamphodiacetates, acylamphopropionates, wherein the acyl group has from about 8 to about 22 carbon atoms. Preferred amphoteric surfactants include, but are not limited to, sodium cocoamphoacetate, sodium lauroamphoacetate, disodium
- 15 caprylamphoacetate, disodium cocoamphodiacetate, disodium lauroamphodiacetate, disodium wheat germamphodiacetate, sodium cocoamphopropionate, disodium capryloamphodipropionate, disodium cocoamphodipropionate, disodium lauroamphodipropionate and the like. Sodium
- 20 cocoamphopropionate is particularly preferred.

- The term "zwitterionic surfactant" refers to that class of surfactants that can exist as intronium or inner salts (i.e., in zwitterionic form) at a pH at and above their isoelectric points (neutral and alkaline pH) and are
- 25 either zwitterionic or cationic below their isoelectric points (acid pH). Suitable zwitterionic surfactants include, but are not limited to, betaine surfactants, such as alkyl betaine, alkylamido betaine and the like and sulfobetaines (sultaines), such as alkyl sultaine,
- 30 alkylamido sultaine and the like, wherein the alkyl group from about 8 to about 22 carbon atoms. Particularly preferred are betaines including, but not limited to, cocobetaine (cocodimethylglycine), octyl betaine, lauryl betaine cetyl betaine, oleyl betaine, cocoamidopropyl

betaine, laurylamido betaine, oleylamidopropyl betaine, isostearamidopropyl betaine, and wheat germamidopropyl betaine.

Anionic surfactants preferably include, without
5 being limited thereto, alkyl sulfates, alkylether sulfates having from 1 to about 10 moles ethylene groups, acylisethionates, sarcosinates, sulfosuccinates and alkali metal salts thereof, wherein the alkyl group or acyl group has from about 8 to about 24 carbon atoms, preferably from
10 about 12 to about 18 carbon atoms, and mixtures thereof. Sodium salts of alkylether sulfates having an average range of from 1 to 4 moles, preferably 3 moles, ethylene oxide are particularly preferred.

Nonionic surfactants preferably include, without
15 being limited thereto, polyethylene oxide condensates of alkyl phenols having an alkyl group, polyoxyethylene alkyl ethers and polyethylene glycol glyceryl fatty esters and the like wherein the alkyl group has from about 6 to about 22 carbon atoms and the polyethylene or polyoxyalkylene
20 groups are derived from about 1 to about 200 moles, preferably from about 10 to about 100 moles, of ethylene oxide, propylene oxide, mixed ethylene oxide and propylene oxide and mixtures thereof.

Cationic surfactants preferably include, without
25 being limited thereto, cetyltrimethyl ammonium chloride, oleyldimethylbenzyl ammonium chloride, stearyldimethylbenzyl ammonium chloride and the like and alkyl amine oxides having from about 8 to 18 carbon atoms in the alkyl group that are cationically charged in acid
30 media.

Commercially available emulsifying surfactants useful for preparing the monoalkanolamide surfactant emulsions are available from a number of suppliers, and a non-limiting list of emulsifying surfactants can be found

in the INCI Dictionary. Preferably the emulsifying surfactants are in the form of aqueous concentrates containing at least about 30 weight percent water.

The selection of the emulsifying surfactant may, but need not, be determined by the class and purpose of the principal surfactant in the aqueous formulation into which the monoalkanolamide surfactant emulsion is subsequently cold mixed or the purpose of the finished product. Thus, the emulsifying surfactant, for example, can be a secondary surfactant, or cosurfactant for the principal surfactant in the final formulation

As used herein, the term "principal surfactant" refers to the main active, detergent or foaming surfactant employed in an aqueous formulation, such as a liquid cleanser or the like for the purpose of providing cleansing, and the term "secondary surfactant" refers to milder, lower foaming surfactants that are commonly employed for added skin protective effects, such as conditioning, or product stabilizing effects, such as viscosity control, lime soap dispersing, and the like. Therefore, it is recognized that the emulsifying surfactants may be in the same or different class as the principal surfactant in the final formulation into which the monoalkanolamide surfactant emulsion is subsequently cold mixed.

Monoalkanolamide surfactant emulsions can be subsequently cold mixed into separately prepared aqueous formulations containing at least one principal surfactant at a temperature of below about 30°C to provide finished products having foam and viscosity characteristics at parity with or greater than that normally achieved with conventional diethanolamides.

The novel monoalkanolamide surfactant emulsions can range from substantially transparent microemulsions to

substantially opaque, white, pearlescent macro emulsions. Substantially transparent microemulsions preferably have a cloud point of not more than about 5°C. Surprisingly, substantially opaque, white pearlescent monoalkanolamide surfactant emulsions not only remained homogeneous, they substantially immediately dispersed, when subsequently incorporated by cold mixing process into a formulation containing at least one principal surfactant to produce a substantially clear final product. The amount of monoalkanolamide surfactant emulsion employed can be readily determined by those skilled in the formulation arts to achieve the desired foam boosting, foam stabilizing, and viscosity control desired. Typically amounts of from about 1 to about 5 active weight percent monoalkanolamide are employed in finished products.

Principal surfactants can be water soluble surfactants or salts thereof selected from the group consisting of anionic surfactants, nonionic surfactants, amphoteric surfactants, zwitterionic surfactants, cationic surfactants and non-interactive mixtures thereof and can be of the same or different surfactant class as the emulsifying surfactants.

Monoethanolamide surfactant emulsions, in particular, are useful as monoethanolamide delivery systems for aqueous cleanser formulations in which the principal surfactant is a deterative surfactant.

Principal deterative surfactants are conventionally employed in liquid personal care cleansers, such as shampoos, liquid soaps, bubble baths and the like, and for light duty liquid household cleansers, such as liquid dish washes, liquid hand soaps and the like, for the purpose of cleansing. Commonly such deterative surfactants are generally anionic surfactants and alkali metal salts thereof selected from the group consisting of, but not

limited to, alkylaryl sulfonates, the so-called soft alkylates, alkyl sulfates, alkylether sulfates having 1 to about 10 moles ethylene oxide-groups, alkyl sulfonates, preferably alpha olefin sulfonates, sulfosuccinates, and the like, where the alkyl group contains from about 8 to about 22 carbon atoms. Particularly preferred are dodecylbenzenesulfonates, sodium lauryl sulfate; sodium lauryl ethersulfate, having an average of about 3 moles ethylene oxide, and sodium C₁₂-C₁₄ olefin sulfonates.

The aqueous monoalkanolamide emulsifying surfactant medium primarily constitutes water, preferably at least about 30 weight percent water on a total weight basis of the monoalkanolamide surfactant emulsion, but the exact amount of water will vary with the amount of water present in the emulsifying surfactant. It is also known and recognized that commercial monoalkanolamide and emulsifying surfactants may contain minor amounts, typically not more than about 15 weight percent on a total actives weight as supplied basis, of non-surfactant, organic solvents such as polyols, alcohols or not more than about 10 weight percent inorganic electrolytes remaining as reaction byproducts or impurities from the feedstock employed for manufacture. For example, typical byproducts of triglyceride containing reactants, such as coconut oils and other glyceride containing plant oils, can be glycerin, inorganic salts, such as alkali metal salts of hydrochloric or sulfuric acids, soaps and the like, which are substantially non-toxic to humans and cosmetically acceptable. Other non-surfactant components that may be present in relatively low amounts, typically not more than about 10 weight percent on a total active material weight as supplied basis, include cosmetically acceptable solvents, such as ethanol, and propylene glycol.

Water-soluble inorganic electrolytes, such as alkali metal salts of hydrochloric acid and sulfuric acid are optionally added to liquid surfactant formulations to control viscosity. Sodium chloride is particularly commonly
5 used as a low cost electrolyte and the inventive monoalkanolamide surfactant emulsion provides the formulator the option of adding or not adding inorganic electrolyte. The monoalkanolamide surfactant emulsion may optionally contain, on a total emulsion weight basis, minor
10 amounts, e.g. up to about 10 percent by weight of inorganic salt, preferably sodium chloride, present as byproducts in the commercial amide and emulsifying surfactant employed.

A particularly preferred monoethanolamide surfactant emulsion embodiment, having a total solids
15 content in the range of at least about 30 weight percent to not more than about 55 weight percent, useful for cold mixing processes can be prepared by emulsifying monoethanolamide in an active amount, on a total emulsion weight basis, of about 6 to about 25 weight percent, with
20 at least one zwitterionic or amphoteric emulsifying surfactant in an aqueous medium containing a weight ratio, on an active weight basis, of monoethanolamide:emulsifying surfactant of about 1:6 to about 6:1 at a temperature in the range of about 40°C to about 70°C, preferably in the
25 range of about 60° to about 70°C, so maintained until homogeneous and then cooled to ambient room temperature for storage.

Surprisingly, monoethanolamide surfactant emulsion embodiments containing commercial cocamide MEA
30 (having an amide content greater than 85%) remained phase stable, homogeneous, pourable, pumpable and cold mixable at ambient temperatures in the range of about zero°C to about 30°C, at a cocamide MEA active concentration, on a total emulsion weight basis, of about 6 to about 25 weight

percent at a total solids content in the range of about 20 to not more than about 60 weight percent on a total emulsion weight basis.

Particularly preferred monoethanolamide surfactant emulsion embodiments contain, on a total emulsion weight basis, from about 6 weight percent to about 25 weight percent on an active weight basis of cocamide MEA; from about 5 weight percent to about 30 weight percent on an active weight percent basis of an amphoteric or zwitterionic emulsifying surfactant, preferably a betaine surfactant and the balance being water. Another such particularly preferred cocamide MEA surfactant emulsion embodiments can also include an anionic emulsifying surfactant and, on a total emulsion weight basis, from zero to about 10 weight percent sodium chloride, from zero to about 10 weight percent ethanol and optionally, fragrance.

The following examples further illustrate the preparation and use of the inventive monoethanolamide surfactant emulsions but are not intended as a limitation thereof. Unless otherwise specified, quantities mentioned in the examples are parts by weight of commercial material on an as supplied basis.

Example 1.

This example illustrates a monoalkanolamide surfactant emulsion embodiment containing a weight ratio of monoethanolamide:cocamidopropylbetaine emulsifying surfactant of about 1:4 to about 1:5 on an active weight basis. An aqueous surfactant medium was prepared by adding 6 parts by weight of coconut monoethanolamide (MACKAMIDE[™] CMA, at least 85% amide content, McIntyre Group Ltd.) to 94 parts by weight of aqueous 35% cocamidopropyl betaine (MACKAM[™] 35, about 5% sodium chloride, McIntyre Group Ltd.). The aqueous surfactant medium was then heated with

mixing agitation to a temperature in the range of from about 60° to about 70°C, so maintained until substantially clear and homogeneous and then cooled to an ambient room temperature of about or below 30°C. The cooled

5 monethanolamide surfactant emulsion was a pourable, substantially transparent, liquid microemulsion, with a viscosity of less than about 5,000 centipoises (cps) at a temperature of about 25°C, (spindle no. 3, 12 rpm, Brookfield LVT viscometer), and was pumpable at an ambient

10 temperature below 30°C.

A liquid microemulsion can have a total solids content in the range of least about 35 to about 45 weight percent of the total microemulsion weight and preferably has a cloud point in the range of about 5°C and -20°C.

15 Alternatively, the foregoing emulsion was prepared by heating the aqueous cocamidopropylbetaine to a temperature in the range of about 65° to about 70°C, maintaining the foregoing temperature while slowly adding the coconut monoethanolamide under stirring agitation until

20 the coconut monoethanolamide was solubilized and the emulsion was homogeneous, the total solids were then adjusted and the microemulsion further cooled to a temperature in the range of about 35° to about 45°C, for storage packaging.

25 In another embodiment, freshly synthesized coconut monoethanolamide, while still in molten form, can be employed for preparing the foregoing microemulsion.

Example 2.

This example illustrates a monoalkanolamide

30 surfactant emulsion embodiment containing a weight ratio of monoethanolamide:cocamidopropylbetaine emulsifying surfactant of about 1:1 on an active weight basis. An aqueous surfactant medium was prepared containing 12 parts

by weight coconut monoethanolamide (MACKAMIDE™ CMA, McIntyre Group Ltd.), 12 parts by weight of cocamidopropyl betaine added as 34.3 parts by weight of aqueous 35% cocamidopropyl betaine (MACKAM™ 35, McIntyre Group Ltd.) and 53.7 parts by weight deionized water and then heated with mixing agitation to a temperature in the range of about 60° to about 70°C, so maintained until substantially clear and homogeneous and then cooled to an ambient room temperature of below about 30°C. The cooled monethanolamide surfactant emulsion was a pourable, white, pearlescent liquid emulsion that remained physically stable (no phase separation) and was readily pumpable at an ambient temperature below 30°C.

Example 3.

This example illustrates a monoalkanolamide surfactant emulsion embodiment containing a weight ratio of monoethanolamide:cocobetaine emulsifying surfactant of about 1:1 on an active weight basis. An aqueous surfactant medium was prepared by combining 25 parts by weight coconut monoethanolamide (MACKAMIDE™ CMA, McIntyre Group Ltd.), 75 parts by weight of aqueous 35% cocobetaine (MACKAM™ CB-35, about 6% sodium chloride, McIntyre Group Ltd.) and 50 parts by weight deionized water. The surfactant medium was then heated with mixing agitation to a temperature in the range of from about 60° to about 70°C, so maintained until substantially clear and homogeneous and then cooled to an ambient room temperature of below about 30°C. The cooled monethanolamide surfactant emulsion was a pourable, white pearlescent liquid emulsion that remained physically stable (no phase separation) and was readily pumpable at an ambient temperature below 30°C.

Alternatively, the foregoing emulsion was prepared by heating the aqueous cocobetaine under a

nitrogen atmosphere to a temperature in the range of about 60° to about 70°C, maintaining the foregoing temperature while slowly adding the coconut monoethanolamide under stirring agitation until the coconut monoethanolamide was solubilized and the emulsion was homogeneous, the emulsion was then cooled to a temperature in the range of about 40° to about 50°C, the total solids were adjusted to a range of about 48 to about 51 weight percent of the total emulsion weight and the adjusted emulsion further cooled to an ambient room temperature in the range of about 30° to about 40°C.

Example 4.

This example illustrates a monoalkanolamide surfactant emulsion containing a weight ratio of monoethanolamide:sodium cocoamphopropionate emulsifying surfactant of about 1.6:1 on an active weight basis. An aqueous surfactant medium was prepared by combining 25 parts by weight coconut monoethanolamide (MACKAMIDE™ CMA, McIntyre Group Ltd.), 37 parts by weight of aqueous 40% sodium cocoamphopropionate (MACKAM™ CSF-CG, McIntyre Group Ltd.) and 38 parts by weight water and then heated with stirring agitation to a temperature in the range of from about 60° to about 70°C, so maintained until substantially clear and homogeneous and then cooled to an ambient room temperature of below about 30°C. The cooled monethanolamide surfactant emulsion was a pourable, white pearlescent liquid emulsion, that remained physically stable (no phase separation) and was readily pumpable at an ambient temperature below 30°C.

Example 5.

This example illustrates a monoalkanolamide surfactant emulsion prepared with a binary mixture of

surfactant emulsifying agents, containing a weight ratio of monoethanolamide:sodium cocoamphopropionate:sodium laureth sulfate emulsifying surfactants of about 1:0.4:1 on an active weight basis. An aqueous surfactant medium was prepared by combining 25 parts by weight coconut monoethanolamide (MACKAMIDE[™] CMA, McIntyre Group Ltd.), 25 parts by weight of aqueous 40% sodium cocoamphopropionate (MACKAM[™] CSF-CG, McIntyre Group Ltd.), 40 parts by weight of aqueous 60% sodium laureth-3 sulfate (average of about 3 moles ethylene oxide) and 10 parts by weight deionized water. The surfactant medium was then heated with mixing agitation to a temperature in the range of from about 60° to about 70°C, so maintained until substantially clear and homogeneous and then cooled to an ambient room temperature of below about 30°C. The cooled monethanolamide surfactant emulsion was a pourable, white, pearlescent liquid emulsion that remained physically stable (no phase separation) and was readily pumpable at a temperature below 30°C.

Example 6.

This example illustrates a monoalkanolamide surfactant emulsion containing a weight ratio of lauric isopropanolamide:lauryl betaine emulsifying surfactant of about 1:1 on an active weight basis. An aqueous surfactant medium was prepared by combining 20 parts by weight lauric isopropanolamide, 70 parts by weight of aqueous 35% lauryl betaine and 10 parts by weight deionized water. The surfactant medium was then heated with mixing agitation to a temperature in the range of from about 60° to about 70°C, so maintained until substantially clear and homogeneous and then cooled to an ambient room temperature of below about 30°C. The cooled isopropanolamide surfactant emulsion was a pearlescent liquid emulsion that remained physically stable

(no phase separation) and was readily pourable and pumpable at a temperature below 30°C.

Example 7.

This example illustrates a monoalkanolamide
5 surfactant emulsion containing a weight ratio of coconut
diglycolamide:cocamidopropyl betaine emulsifying surfactant
of about 1:1 on an active weight basis. An aqueous
surfactant medium was prepared by combining 20 parts by
weight coconut diglycolamide, 70 parts by weight of aqueous
10 35% cocamidopropyl betaine and 10 parts by weight water.
The surfactant medium was then heated with mixing agitation
to a temperature in the range of from about 40° to about
60°C, so maintained until substantially clear and
homogeneous and then cooled to an ambient room temperature
15 of below about 30°C. The cooled diglycolamide surfactant
emulsion was a pearlescent liquid emulsion that remained
physically stable (no phase separation) and was readily
pourable and pumpable at an ambient temperature below 30°C.

Example 8.

20 This example illustrates the effective use of the
inventive monoalkanolamide surfactant emulsions as improved
delivery systems in cold mixing processes.

A clear, light duty, liquid cleanser containing
anionic surfactant as the principal surfactant was prepared
25 in a cold mixing process with all ingredients at an ambient
temperature of below 30°C as follows. First, an aqueous
solution of 80 parts by weight of aqueous 15% sodium lauryl
sulfate was placed under mixing agitation and then 20 parts
by weight of a pearlescent monoethanolamide surfactant
30 emulsion previously prepared as described in example 2 was
cold mixed therein. The pearlescent surfactant emulsion
substantially immediately dissolved into the anionic

surfactant solution and a clear, light duty, liquid cleanser was obtained within about 4 minutes without requiring any heating.

Example 9.

5 This comparative example illustrates the need to use conventional heat processing methods when the inventive monoalkanolamide surfactant emulsions are not employed.

 A mixture of 80 parts of an aqueous 15% sodium lauryl sulfate solution, and 18.6 parts by weight of
10 aqueous 35% cocamidopropyl betaine was prepared at an ambient room temperature of below about 30°C and then 1.4 parts by weight of coconut monoethanolamide in solid, flaked form was added with mixing agitation. After a mixing period of about 5 hours at ambient room temperature, the
15 solid flaked coconut monoethanolamide was still in suspension and undissolved.

 The same mixture was then heated to above the melting point of the coconut monoethanolamide; i.e., to above about 60°C, at which temperature the coconut
20 monoethanolamide solubilized and formed a clear product which remained clear on cooling to ambient room temperature.

Example 10.

 This example illustrates the effective use of the
25 inventive monoalkanolamide surfactant emulsions as fragrance solubilizers in a cold mixing processes.

 A fragranced monoethanolamide surfactant emulsion was prepared by cold mixing equal parts by weight of lemon fragrance and a monoethanolamide surfactant emulsion of
30 Example 3 to disperse the fragrance. The fragranced monoethanolamide surfactant emulsion was a pourable, pearlescent liquid.

The fragranced monoethanolamide surfactant emulsion, 20 parts by weight, was then subsequently cold mixed (at a temperature of below 30°C) into 80 parts by weight of an aqueous 15% sodium laureth-3 sulfate solution with mixing agitation. The pearlescent fragranced monoethanolamide surfactant emulsion substantially immediately dissolved into the anionic surfactant solution and a substantially clear, fragranced, liquid cleanser was obtained within several minutes.

10 The present invention has been described generally and with respect to preferred embodiments. It will be understood that modifications and variation of the disclosed composition and processes may be made without departing from the spirit and scope of the novel concept of
15 the present invention.

WE CLAIM:

1. A liquid aqueous monoalkanolamide delivery system in the form of a phase stable, pumpable, high solids monoalkanolamide surfactant emulsion at a temperature in
5 the range of zero°C to about 30°C comprising, on a total emulsion weight basis:

about 1 to about 30 weight percent on an active weight basis of at least one monoalkanolamide characterized in it unemulsified form by having an amide content of at
10 least 85%, and being substantially solid and water insoluble at a temperature below about 30°C;

about 5 to about 30 weight percent on an active weight basis of at least one monoalkanolamide emulsifying surfactant;

15 zero to about 10 weight percent water soluble inorganic electrolyte salt;

zero to about 15 weight percent non-surfactant, organic solvent; and

the balance being water;

20 wherein the monoalkanolamide surfactant emulsion contains a total solids content in the range of at least about 20 weight percent to not more than about 60 weight percent and is cold mixable into a separately prepared liquid aqueous formulation containing at least one
25 principal surfactant.

2. The monoalkanolamide surfactant emulsion of claim 1 wherein the weight ratio, on an active weight basis, of monoalkanolamide:emulsifying surfactant is in the range of about 1:6 to about 6:1.

30 3. The monoalkanolamide surfactant emulsion of claim 1 wherein the monoalkanolamide is selected from the group consisting of monoethanolamides, monoisopropanolamides, diethylene glycolamides and mixtures thereof.

4. The monoalkanolamide surfactant emulsion of claim 1 wherein the monoalkanolamide is monoethanolamide in an amount of about 6 to about 25 weight percent by weight on a total emulsion weight basis.

5 5. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant is a water soluble surfactant or salt thereof selected from the group consisting of amphoteric surfactants, zwitterionic surfactants, anionic surfactants, nonionic surfactants, 10 cationic surfactants and non-interactive mixtures thereof and is the same or different.

6. The monoalkanolamide surfactant emulsion of claim 1 wherein the surfactant emulsion is substantially transparent or pearlescent.

15 7. The monoalkanolamide surfactant emulsion of claim 1 wherein the monoalkanolamide comprises an alkanolamine condensate of a fatty acid selected from the group consisting of lauric acid, palmitic acid, stearic acid, oleic acid, linoleic acid and mixtures thereof.

20 8. The monoalkanolamide surfactant emulsion of claim 1 wherein the monoalkanolamide comprises an alkanolamine condensate of fatty acids derived from plant oils selected from the group consisting of coconut oil, soybean oil, canola oil, wheat germ oil, peanut oil, corn 25 oil, olive oil and mixtures thereof.

9. The monoalkanolamide surfactant emulsion of claim 1 in which the monoalkanolamide is selected from the group consisting of coconut monoethanolamide, lauric monoethanolamide, stearic monoethanolamide, oleic 30 monoethanolamide, linoleic monoethanolamide, lauric isopropanolamide, coconut diglycolamide and mixtures thereof.

10. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant is an amphoteric

surfactant selected from the group consisting of acylamphoacetate, acylamphodiacetates, acylamphopropionates, and water soluble salts thereof wherein the acyl group has about 8 to about 22 carbon atoms.

11. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant is a zwitterionic surfactant selected from the group consisting of alkyl betaine, alkylamido betaine, alkyl sultaine, and alkylamido sultaine wherein the alkyl group has from about 8 to about 22 carbon atoms.

12. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant is sodium cocoamphopropionate.

13. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant is cocobetaine.

14. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant is cocamidopropyl betaine.

15. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant is lauryl betaine.

16. The monoalkanolamide surfactant emulsion of claim 1 in which the monoalkanolamide is coconut monoethanolamide and the emulsifying surfactant is selected from the group consisting of amphoteric surfactants, zwitterionic surfactants, anionic surfactants and mixtures thereof.

17. The monoalkanolamide surfactant emulsion of claim 1 wherein the emulsifying surfactant comprises an anionic surfactant selected from the group consisting of alkyl sulfates, alkyl ether sulfates having from 1 to about 10 moles ethylene oxide groups, acylisethionates, sarcosinates, sulfosuccinates and alkali metal salts

thereof, wherein the alkyl group or acyl group has from about 8 to about 24 carbon atoms, and mixtures thereof

18. The monoalkanolamide surfactant emulsion of claim 1 further including fragrance.

5 19. The monoalkanolamide surfactant emulsion of claim 1 wherein the inorganic electrolyte salt is selected from the group consisting of alkali metal salts of hydrochloric acid and sulfuric acid.

10 20. The monoalkanolamide surfactant emulsion of claim 1 wherein the non-surfactant organic solvent is a cosmetically acceptable polyol, alcohol or mixture thereof.

21. The monoalkanolamide surfactant emulsion of claim 1 wherein the monoalkanolamide surfactant emulsion is pearlescent and when subsequently incorporated by cold
15 mixing into a liquid aqueous formulation containing at least one principal surfactant produces a substantially clear product.

22. A cold mixing process for preparing a liquid aqueous cleanser containing monoalkanolamide, the process
20 comprising the step of cold mixing as by pumping a monoalkanolamide surfactant emulsion of claim 1 into a separately prepared aqueous formulation containing at least one principal surfactant.

23. The cold mixing process of claim 22 wherein
25 the monoalkanolamide is coconut monoethanolamide.

24. The cold mixing process of claim 22 wherein the monoalkanolamide emulsifying surfactant is an amphoteric selected from the group consisting of acylamphoacetate, acylamphodiacetates,
30 acylamphopropionates, and water soluble salts thereof wherein the acyl group has about 8 to about 22 carbon atoms and the principal surfactant is an anionic surfactant selected from the group consisting of alkylaryl sulfonates, alkyl sulfates, alkyl ether sulfates, having from 1 to

about 4 moles ethylene oxide, alkyl sulfonates, sulfosuccinates and alkali metal salts thereof and mixtures thereof, wherein the alkyl group contains from about 12 to about 18 carbon atoms.

5 25. The cold mixing process of claim 22 including the further-step of solubilizing a fragrance in the monoalkanolamide surfactant emulsion prior to the cold mixing step.

 26. The cold mixing process of claim 22 wherein
10 the aqueous monoalkanolamide surfactant emulsion is pearlescent and produces a substantially clear cleanser.

 27. The cold mixing process of claim 22 wherein the cleanser is in the form of a shampoo, bubble bath, liquid soap or body wash.

15 28. A monoethanolamide surfactant emulsion comprising on a total emulsion weight basis;

 about 6 to about 25 weight percent on an active weight basis of coconut monoethanolamide;

 about 5 to about 30 weight percent on a total
20 active weight percent basis of emulsifying agent selected from the group consisting of amphoteric surfactants, zwitterionic surfactants, anionic surfactants, non-interactive mixtures thereof;

 up to about 10 weight of inorganic alkali metal
25 salt of hydrochloric or sulfuric acid;

 up to about 15 weight percent nonsurfactant, cosmetically acceptable, organic solvent; and

 the balance being water,
wherein the emulsion is a phase stable, homogeneous,
30 pourable, and pumpable liquid at a temperature in the range of from about zero°C to about 30°C and contains a total solids content in the range of about 20 weight percent to not more than about 60 weight percent.

29. The monoethanolamide surfactant emulsion of claim 28, further including fragrance.

30. The monoalkanolamide delivery system of claim 1 wherein the monoalkanolamide surfactant emulsion is
5 formed by first emulsifying the monoalkanolamide at a temperature in the range of about 40° to about 70°C with the emulsifying surfactant in the form of an aqueous concentrate containing at least about 30 weight percent water, and second adjusting the total solids content of the
10 so formed emulsion to a range of at least about 20 weight percent to not more than about 60 weight percent by adding sufficient water thereto.

31. The monoalkanolamide delivery system of claim 31, wherein the monoalkanolamide surfactant emulsion
15 is prepared under an inert atmosphere.

DECLARATION

- Utility or Design Patent Application

I hereby claim the benefit under 35 U.S.C. 120 of any United States application(s), or 365(e) of any PCT international application designating the United States of America, listed below, and insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States of PCT International application in the manner provided by the first paragraph of Title 35 U.S.C., 112, I acknowledge the duty to disclose information which is material to patentability, as defined in 37 C.F.R. 1.56, which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application or PCT Parent Number

Parent Filing Date
(MM/DD/YYYY)

Parent Patent Number
(if applicable)

09/292,765
now Provisional No. 60/287,574

04/14/1999

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority data sheet attached hereto.

As a named inventor, I hereby appoint the following registered practitioner(s) to prosecute this application and to transact all business connected therewith in the Patent and Trademark Office

☐ Customer Number _____ or ☒ Registered Practitioner(s) name/registration numbers listed below

Name	Registration Number	Name	Registration Number
Arne M. Olson	30,203	Michael A. Hierl	29,807
Dolores T. Kenney	31,269	Talivaldis Cepuritis	20,818
Seymour Rothstein	19,369	Daniel J. Deneufbourg	33,675

☒ Additional registered practitioner(s) named on supplemental Registered Practitioner Information sheet attached hereto.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon

Name of Sole or First Inventor:

☐ A petition has been filed for this unsigned inventor

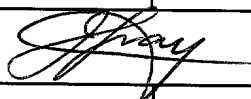
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☒ Additional inventors are being named on the 1 supplemental Additional Inventor(s) Sheet(s) attached here

DECLARATION	REGISTERED PRACTITIONER INFORMATION (Supplemental Sheet)
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DECLARATION	REGISTERED PRACTITIONER INFORMATION (Supplemental Sheet)
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Martin J. Corn	<u>35,847</u>		
Richard L. Robinson	<u>31,415</u>		
David A. Gottardo	<u>46,736</u>		
Robert J. Ross	<u>45,058</u>		

DECLARATION

ADDITIONAL INVENTOR(S) Supplemental Sheet

Page 1 of 1

I hereby claim the benefit under

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☐ A petition has been filed for this unsigned inventor

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**DECLARATION FOR UTILITY OR
DESIGN PATENT APPLICATION
(37 CFR 1.63)**

☒ Declaration Submitted
with Initial Filing ☐ Declaration
Submitted after
Initial Filing

Attorney Docket Number

MCI-004.1

First Named Inventor

Gray

COMPLETE IF KNOWN

Application Number

Filing Date

September 27, 2001

Group Art Unit

Examiner Name

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first, and sole inventor (if only one name is listed) or an original, first, and joint inventor (if more than one name is listed) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

ALKANOLAMIDE SURFACTANT EMULSIONS AND PROCESS THEREFOR

the specification of which:

☐ is attached hereto;

☒ was filed on April 14, 2000 as United States Application Number or PCT International Application
Number PCT/US00/09927

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the patentability of this application, as defined in 37 CFR 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT international application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT international application having a filing date before that of the application on which priority is claimed.

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES NO	
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority data sheet attached hereto.

I hereby claim the benefits under 35 U.S.C. 119(e) of any United States provisional application listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	<input type="checkbox"/> Additional provisional application numbers are listed on a supplemental priority data sheet attached hereto.
60/287,754 (formerly 09/292,765)	14/04/1999	